

REMARKS

Applicants would like to acknowledge the Examiner's determination that the subject matter of original Claims 6 and 8, drawn to a process for the depolymerization of glycosaminoglycanes comprising irradiation with an electron beam in the presence of a specific class of organic compounds (Claim 6), wherein the concentration of the organic compound in the reaction is from 0.1% to 5% (Claim 8), would be allowable if rewritten in independent form including all of the limitations of the base claim and all intervening claims.

In response, Applicants have canceled Claims 1-10 and introduced new claims 11-16. New Claim 11 incorporates the subject matter of Claim 6 with base Claim 1, Claim 5 (depolymerization process performed in aqueous solution), and Claim 8. New Claim 11 is directed to a process for the depolymerization of glycosaminoglycanes comprising exposing an aqueous solution to electron beam radiation, the solution comprising water, a glycosaminoglycane and an organic compound selected from the group consisting of Formula I, II, or III.

New Claim 12, (subject matter corresponding to original Claim 2), dependent from Claim 11, specifies that the step of exposing the aqueous solution to electron beam radiation is performed by a dynamic irradiation process.

New Claim 13, (subject matter corresponding to original Claim 3), dependent from Claim 11, specifies that the glycosaminoglycane is heparin.

New Claim 14, (subject matter corresponding to original Claim 4), dependent from Claim 11, specifies that the energy of the electron beam radiation is from 100keV to 1000keV.

New Claim 15, (subject matter corresponding to original Claim 7), dependent from Claim 11, is directed to a class of organic compounds suitable for use in the process of Claim 11.

New Claim 16, (subject matter corresponding to original Claim 9), dependent from Claim 11, specifies that the amount of radiation in the depolymerization process of Claim 11 is from 400kGy to 8000kGy.

Support for new Claims 11-16 may be found in original Claims 1-9. No new matter is introduced by new Claims 11-16. Entry and allowance of new Claims 11-16 are respectfully requested.

Objections to the Specification

The Examiner has objected to the Abstract in that it was submitted as the first page of the published version of the present application (WO 2004/000886). In response, on the "Amendments to Specification" page above, Applicants have instructed that the present Abstract be deleted and presented on a separate page with instructions to insert the Abstract on the last page of the application immediately following the claims, i.e., as new page 12. The new Abstract is substantially similar to the Abstract presented on the first page of WO 2004/000886 referred to by the Examiner, and therefore no new matter is added by the Abstract. A new page 12 is included herewith (Tab A).

The Examiner has objected to the format of the claims as submitted with the Preliminary Amendment. Specifically, the Examiner states that the claims should begin with "We Claim" or "What is claimed is". In response, Applicants have included "What is claimed is" in the new set of claims submitted with this response (above).

Applicants have amended the specification to delete the paragraph appearing on page 5 from line 5 to line 11. This paragraph describes the apparatus appearing in "Fig. 1". The apparatus described on page 5, lines 5-11, is not part of the present invention and is not required for one skilled in the art to practice the invention disclosed herein. Also, the specification has been amended on page 6, line 14, to delete the reference to Fig. 1. Amendment of the specification to remove the reference to Fig. 1 is respectfully requested. MPEP §601.01(g).

Also, Applicants have made minor amendments to the specification to correct typographical errors appearing on page 5, line 25, and page 6, line 13.

In addition, Applicants have amended the paragraph beginning on page 6, lines 13-22, i.e., Example 1, to reflect the past tense to indicate that the experiment described therein was actually performed and therefore does not relate to a "prophetic" example. No new matter is added by these amendments.

No new matter is introduced by the above-referenced amendments to the specification. Entry of the amendments to the specification is respectfully requested.

Non-Statutory Obviousness-Type Double Patenting

The Examiner has raised a non-statutory obviousness-type double patenting rejection against Claims 1, 3, and 7 of the present application as unpatentable over Claims 1, 2, and 5 of U.S. Pat. No. 7,091,337 ("the '337 patent").

Applicants have canceled Claims 1, 3, and 7 and therefore this objection is now moot.

35 U.S.C. §102(b)

The Examiner has objected to Claims 1, 3, and 5 as anticipated by Cho et al. KR20000036332 (abstract). In particular, the Examiner alleges,

"Cho et al. teach the preparation of low molecular weight heparin by exposing an aqueous solution of high molecular weight heparin using electron beam." (See, Office Action, page 4.)

Applicants assert that the cancellation of Claims 1, 3, and 5 render this objection moot: The amended claim set is directed to processes not subjected to this rejection. In addition, Applicants assert that new Claims 11-16 are clearly not anticipated by the Cho et al. reference. The method of manufacturing low molecular weight polysaccharides as disclosed in the Cho et al. reference abstract requires the addition of titanium oxide or other photocatalyst to drive the reaction forward. In contrast, in the present application, Applicants assert that it was surprising that the present method could achieve depolymerization of glycosaminoglycans without the use of a photocatalyst. In addition, there is no teaching or suggestion in Cho et al. that depolymerization could be achieved without a photocatalyst, i.e., by simply subjecting an aqueous solution containing a glycosaminoglycane to electron beam radiation.

Therefore, the invention disclosed in new independent Claim 11 and dependent Claims 12-16 cannot be anticipated by the Cho et al. reference.

35 U.S.C. §102(b)

The Examiner has rejected Claim 10 as anticipated by DeAmbrosi et al., U.S. Pat. No. 4,987,222. Applicants have canceled Claim 10 and therefore this rejection is rendered moot.

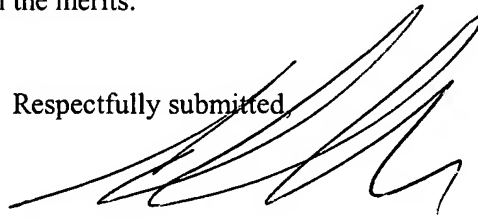
35 U.S.C. §103(a)

The Examiner has rejected Claims 2, 4, and 9 as being unpatentable over Cho et al., *supra*. Applicants have canceled Claims 2, 4, and 9 and therefore this objection is rendered moot. The amended claim set is directed to subject matter that was not rejected in view of Cho et al. As stated above, new claims 11-16 are clearly distinguishable over the method of Cho et al. as the present method for depolymerization of glycosaminoglycans does not require the inclusion of a photocatalyst such as titanium oxide, as taught by Cho et al.

Applicants believe that new Claims 11-16 define a novel method for the depolymerization of glycosaminoglycans not disclosed by the cited art. Entry and allowance of new Claims 11-16 are respectfully requested.

Applicants reserve the right to carry the subject matter of canceled claims 1-10 forward in a continuation application for examination on the merits.

Respectfully submitted,

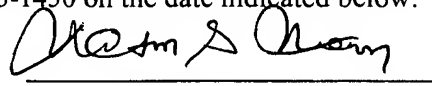


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